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AUTHOR Podhajski, Blanche; And Others
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ABSTRACT

Described and illustrated with charts and tables is a model program for learning disability students at the University of Vermont. The program is said to feature an interprofessional team of educational, clinical, and medical specialists. Reviewed are the five steps in the Problem Oriented System for Educational Services (P.O.S.E.): identification, tentative definition of the problem, diagnosis, classroom educational plan, and evaluation of the remediation plan. Medical aspects of learning disability diagnosis, including soft neurological signs, are analyzed, and the need for differential diagnostic testing is emphasized. Six considerations in remedial strategies, including the importance of flexible programing for learning disabled students, conclude the narrative. Appended are nine charts (including diagrams of the P.O.S.E. approach), and six tables (including a list of selected assessment measures). (CL)

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AN INTERPROFESSIONAL PROBLEM-SOLVING APPROACH FOR SPECIFIC LEARNING DISABILITIES: CLINICAL, MEDICAL, EDUCATIONAL

Blanche Podhajski, M.S., Director, Antonio J. Gomez, M.D., Medical Director, Center for Disorders of Communication, Department of Neurology, University of Vermont, Medical Center Hospital of Vermont, Burlington, Vermont;
Patricia M. Zyber, M.S., Communication Skills Specialist, Chittenden Central School District, Essex Junction, Vermont

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INTRODUCTION

As we look back in the history of treatment approaches for children with Specific Learning Disability (SLD), the word "model" arises repeatedly. The three most common, perhaps, are the medical model, the diagnostic-prescriptive model, and the educational model. Concentrating on these, it is interesting to review how we have evolved professionally.

The medical model is seen as concerned with the etiology of the child's learning handicap. Goldstein, Strauss and Werner, Orton, and Broca, among others, postulated possible origins of language disorders in adults and children. The term "minimal brain damage" evolved, to be later replaced by the non-descript "minimal brain dysfunction" (MBD). There are those who suggest that MBD is the medical synonym for SLD. MBD, however, is less specific and could blanket other problems as well.

The diagnostic-prescriptive model introduced the diagnostic intrigues of testing and very meaningfully helped us learn what factors within a child's speech, language or learning make-up were deficient. Careful analysis of receptive and expressive, auditory and visual components of the child's learning style were delineated and, in many instances, taught to. Children began to display "auditory sequential memory problems", "visual receptive deficits", and the like. Kirk, Eisenson, and Frostig, among others, are well remembered for their contributions.

The educational model familiarized us with new terms such as "task analysis" and reintroduced old terms such as "behavior modification". Specific teaching techniques, i.e., Distar, Monterey Learning Programs, etc., and token economies became common inclusions within the classroom. The era of accountability began, and, with the rapidly declining reading rate and the increasing awareness of speech and language difficulties in children, teachers began to chart increments of behavioral and academic progress. Objectives were outlined to be structuredly adhered to in hopes of meeting a particular child's needs.

Our objectives are not to promote a different 1976 "model". Rather, it is our intent to urge recognition of the relevance today of all three models. Medical

information is important, not only for establishing the cause or causes of SLD but also in differentiating it from other neurological problems, e.g. petit mal seizures. Diagnostic-prescriptive information is most helpful in determining whether or not a child will profit from an auditorily based reading program or sight reading techniques. Educational strategies need to continue to be researched so that options can be made available to treat different aspects of the language/learning process effectively. In this way, a responsive, interdisciplinary approach which treats the total child can evolve. This has been our goal in developing a closely united school-community-medical center program for SLD children. It is our supposition that the kinds of children presently being referred to us as professionals in learning problems are indeed complex and require this kind of thorough interaction. We hope to be able to express the practical aspects of pooling community resources to best service the SLD child.

Despite recent controversy, it is our belief that SLD does exit in children as a specific entity manifested by different symptomatology, that it has a continuum of degrees and that it is comprised of three types: audio-verbal, visual-motor and mixed. The matrix in Figure 1 illustrates the problem by type, degree and signs and symptoms.

STATEMENT OF THE PROBLEM

Issues perpetually plaguing the differential diagnosis of learning disabilities in children are the following: definition, territorialism and heterogeneity. We plan to present our definition of SLD, refute the issue of territorialism, and discuss the heterogeneity within this population -- that is, what makes these children different from others with learning problems?

Definition

Specific learning disability is considered synonymously with specific language disability. Language, defined simply, is a system of sequential symbols. Learning

through the oral and written symbols of language is an arduous task for SLD children. SLD occurs in children of average or above average intelligence who do not learn through traditional teaching techniques because of an interference in the developmental learning process, possibly secondary to integrative difficulties. We concur that this is a definition of exclusion, that certain physiologic components are evidenced, and that discrepancies exist between intellectual functioning and academic achievement. The consistency of the SLD child's learning inconsistencies is apparent. Table I illustrates other problems from which SLD must be differentiated. Some of these, of course, overlap.

It is often helpful to review what might be considered a child's four ages; chronological age, mental age, developmental age, and social age. For example, a 7 year 6 month old child may have an intelligence quotient equivalent to a mental age of 8 years 6 months and a developmental age of 6 years 5 months on visual-perceptual-motor tasks. His social age is proportionate to his chronologic and mental ages, unlike the mentally retarded child whose social age more readily conforms to the mental age and developmental age which fall considerably below the chronologic age. Developmentally he is different.

With the recent concentration upon educational objectives and accountability, a definition of learning disabilities has gotten lost in the shuffle. The use of diagnostic terms or "labeling" has also taken on negative connotations. "Mainstreaming" children is in vogue and attention has been directed towards <u>what</u> we teach rather than <u>who</u> we teach. While the importance of different teaching strategies within a regular classroom cannot be under-emphasized, it is our contention that a definition should be grappled with because labeling does count! We need not label prematurely nor without adequate diagnosis, however, we should be professionally qualified enough to venture forth and call a learning disability a learning disability when it does occur. We should not be professionally caught in an either/or situation, to label or to teach. Rather, labels and definitions should be educationally relevant to programming instruction.

Territorialism

SLD problem-solving is interdisciplinary, requiring the services of physicians, speech and language pathologists, teachers and psychologists, among others. Care must be taken to guard against child fragmentation among specialists. Once SLD is suspected, a referral should be made through the school special education network. This may be the guidance counselor, the learning disabilities specialist, the speech pathologist or the school psychologist, depending upon the system. Referrals through outside agencies should be made if facilities within the system are insufficient or if past test results are so confusing that another opinion should be sought. There may also be occasions when disagreement among professionals or between parents and school personnel persist regarding a particular child. In that situation, a comprehensive evaluation by a neutral agency may be appropriate.

Compiling information to aid in the diagnosis is important. The child's medical history, results of the developmental milestones survey, previous test scores and classroom performance reports, both subjective and objective, are helpful. What methods of education and remediation have been employed with this child? At what chronologic and developmental ages were the child when these techniques were employed? Many a teacher will frustratingly express that "every method has been tried", seemingly unaware of the importance of meeting mind with method and maintaining a program course for an ongoing period of time. We are often too critical of our own shortcomings as educators and demand immediate results when we should rather be using time as our ally. Also, certain clinical programs supposedly used with children have been so modified that they no longer resemble the original intent of that therapeutic program.

Heterogeneity

Difficulties in the learning process may involve mainly one modality system, for example, the auditory, or the visual. A learning task, in addition to being mainly auditory or visual, may also require converting what is acquired through one

modality into another, i.e., a cross-modal process. For example, a child may know that the word /mother/ begins with the /m/ sound but be unable to associate the sound with the shape of the letter as it is seen when printed: /m/. Of course, the opposite can also occur: the child recognizes /m/ as an "m" but is unable to associate it with its corresponding sound /m/. It has been shown that many SLD youngsters cannot convert one type of learning into another. They cannot bridge modalities and may have difficulty converting verbal learning into its non-verbal counterpart or vice versa. Furthermore, in order to truly profit from knowledge acquired through the senses, that knowledge has to be integrated and generalized. Experiences after the early developmental years are not only auditory or visual, but rather are a composite of all knowledge meaningfully and distinctly assimilated. The SLD child is often unable to integrate his learning from one area into another. These kinds of complexities create different academic and social behaviors in the classroom.

Early identification is critical to maximal effectiveness of educational intervention. Between the ages of 4 and 7, differentiating among SLD, mild mental retardation, and developmental lag is extremely difficult. While it need not be critical to pinpoint precisely which of these three problems interferes with the child's academic success, early recognition of an apparent problem for test/re-test purposes will be important.

EDUCATIONAL ASPECTS

The public school component of an interprofessional team is the unit legally responsible for identification of learning problems, for obtaining solutions for those problems and for establishing the appropriate learning environment which meets individualized learning needs satisfactorily. However, from the public school point of view, it has always been difficult getting to the SLD child in need of special services early enough before secondary complications, such as, reduced self-image

and emotional problems develop. Once learning needs are identified, it is often difficult to mobilize school personnel in a unified approach to remediation using appropriate intervention strategies. Development of an effective system for delivery of services to the SLD child is critical.

The kind of clinical, medical and educational approach being presented is not idealistic. The following is a description of an actual working model. Essentially, the model utilizes public school resources within the framework of their individual capability together with clinical and medical services in an integrated, child-oriented manner. The results of this model's approach have been beneficial from identification to diagnosis through prescriptive programming and classroom instruction for the SLD child because of the "spin off" effect.

This working relationship was based on the use of a structured identification system developed by the school district personnel tailored to both the educational philosophy and special services structure of the public school. It defined the route by which available clinical and medical resources could be sought.

The most important consideration in the recognition of SLD is early identification. While the nomenclature "early identification and intervention" is definitely the trend in planning educational programs, any such plan is unrealistic unless the child's needs are identifiable at some primary point by an observer skilled enough to activate an interprofessional team for diagnosis and program planning.

In emerging from a period of "wait 'till he outgrows it" to a behavioristic "don't name it - describe it" period, some of the perspective has been skewed. It is important not to tag a child with a label, particularly if it is restrictive or, more importantly, if it is incorrect. But, fear of labels and definitions has left educators reticent to identify specific learning needs. The goal should be to find the basic problem and remediate it, supporting the premise that specific remedial procedures depend upon accurate diagnosis. The identification of the basic problem is not necessarily an easy task since behavioral descriptions overlap many types of

learning problems. However, certain behavioral patterns can flag a potential problem if we are willing to accept them. There is need to identify patterns of learning behavior for two reasons. First, unless some significance is related to these patterns a problem may not be identified. Second, if the problem is not promptly identified, remedial or compensatory procedures may not be instituted at an appropriate time.

There are characteristics of potential SLD which can be observed in the early grade classroom. Subjectively, the teacher is aware of the child who "appears bright" in comparison to his peers but doesn't seem to demonstrate that capability uniformly. The child may be able to describe how rockets blast off to Mars but has a poor bank of knowledge about himself, home location, family size and relationships, etc. There may also be evidence of auditory processing difficulties observed both at home and in school. This child can reportedly recall accurately the route to a friend's home across town but cannot retain verbal input for following directions. These and other subtle characteristics can be significant when collated with other information including cognitive skills, social behavior, motoric and maturational development.

One means of organizing these observations is the use of a check list of classroom behaviors which the observer can use as a guide in ranking the child on a scaled continuum. This can be an effective method of providing information to parents, school personnel or specialists. The check list, also a tool for teachers, provides an objective base for subjective observation. It can help determine the need for more thorough investigation, such as a diagnostic evaluation. For this reason, there should be no timidity in refining and organizing descriptive terms for tentative problem identification.

The development of an identification procedure is but the first step in providing an organized base for the instructional needs of the SLD child. The following is a description of the identification system of the Chittenden Central School District in Essex Junction, Vermont, developed by representative staff assigned to a special task force.

The system has been in effect for three years and is now firmly established and accepted by the total school staff. The active participation in its development by all school personnel contributed significantly to its acceptance.

The process consists of five steps. Collectively, they comprise the Problem Oriented System for Educational Services (P.O.S.E.).

Step 1 - Identification

Using a checks and balances approach, several means of identification are provided to activate the system. Annual analysis of achievement test scores provides a systematic screening of student performance, alerting school personnel to potential problems. Parent concern can be translated into evaluative action through P.O.S.E.

Classroom teachers and educational specialists, noting a change in a student's rate of progress, can initiate a classroom observation using a behavioral checklist. Screening entering students assures early identification of learning or developmental needs. Parent awareness of the need for the evaluation procedure and their permission to proceed are first line requirements of the school personnel. (Figure 2)

Step 2 - Tentative Definition of the Problem

Using screening and observational information, the primary initiators of the student identification review the information, tentatively define the problem area and make a decision regarding an in-house staffing with the appropriate personnel. The record keeping system has a structured format to assure collection of pertinent information.

Following the in-house staffing a decision to seek assistance from an outside agency is often made. Other alternatives involve the utilization of in-house personnel to evaluate and/or plan remedial intervention. However, the services of an outside agency can substantiate the problem behaviors observed at the local level, clarify the problem by separating strengths from weaknesses, recommend special procedures or programs specific to each child's needs, and support school recommendations to parents or vice versa. (Figure 3)

The school district provides funds for outside diagnostic services so that no family or student is denied the service. Each family is given the opportunity to select the service agency of its choice and funding source. Direct contact between the student's family and the agency follows referral.

Step 3 - Diagnosis

The in-house staff, having made the decision to seek help from an outside agency, provides that agency with the results of its evaluation, a mutually advantageous procedure. The school or parents are assured of an on-target evaluation without duplication of effort, and the agency can avoid the use of time consuming probes and proceed directly to in-depth diagnostic testing.

A joint staffing, between the school and the clinical center, involving the classroom teacher(s), specialists and administrators best translates the recommendations into action in the classroom. (Figure 4). The importance of the classroom teacher(s) becoming an active team member(s) cannot be over-emphasized.

The dynamics of a team staffing can effect a leveling of professional stratification. The results are to the advantage of the child-learner because better, more realistic communication results.

Step 4 - Classroom Educational Plan

The educational plan must consider the needs of the child as well as the resources of the school. Direct instructional trial experiences with the child and demonstrations for the teacher promote child, parent and teacher confidence in the viability of the proposed plan.

Often follow-up conferences occur in the school setting shortly after a joint team staffing to re-affirm the suggested plan, communicate the method of daily delivery and establish patterns of regular communication between parents and educators. (Figure 5).

Step 5 - Evaluation of Remediation Plan

Follow-up of a prescribed educational plan must be maintained for a reasonable duration. Problems can occur when plans are dropped prematurely because of the lack of coordination among personnel to move them to completion.

P.O.S.E. incorporates evaluation of the student's progress into the overall plan. Regularly scheduled check points are established for the interprofessional team to monitor the program. Clinical resources are involved in re-evaluation of the remedial strategy. Joint team staffings determine if the plan should be maintained, revised or discontinued (Figure 6).

In summary, the system is aimed at providing special services to the SLD child by utilization of school resources in concert with center-based clinical and medical services, thereby maximizing the professional expertise at hand. Multidisciplinary interfacing with clinical and medical resources can improve instructional programming for the SLD child providing educators recognize that SLD is not just a school-based problem. The clinical specialist and the physician do provide valuable information which is essential in the development of a comprehensive plan to meet the needs of the total child. The Chittenden Central School District and the Center for Disorders of Communication have found it beneficial to utilize this multidisciplinary, interprofessional approach in dealing with the SLD child in Vermont.

MEDICAL ASPECTS

Etiologic determination has been the traditional physician role in the field of SLD. When the diagnostic approach to SLD was consigned to three compartments, the medical model meant an etiologically oriented diagnosis. Confining physicians to such a narrow role has prevented a more active medical participation. Diagnosis aimed at establishing the cause of the problem is important for understanding the nature of the problem, preventive measures and etiologic-specific treatment. Diagnosis, however, is a dual concept: etiologic and clinical. Clinical diagnosis

is the recognition of a particular problem through a constellation of characteristic symptoms and signs. Diabetes mellitus was recognized as a medical entity long before it was known to be due to insulin lack. Physicians have for a long time encountered SLD. Until recently, however, the clinical picture was not clear. Now that SLD is better defined, the more astute physicians have increasingly utilized the expertise of other professional disciplines in the diagnosis and management of such children who come to their attention.

The cause or causes of SLD are not settled. The higher incidence of reading disability among males as well as the occurrence of the problem in more than one family member raises the possibility of a genetic etiology. While it is accepted that SLD stems from neural organizational defect, the exact site is not definitely determined. The phonemes, the basic symbols for oral language, have a precise temporally dispersed sequence, the analysis of which is a specialized function of the left hemisphere. The right hemisphere, on the other hand, excels in form recognition and spatial relationships, the analysis of symbols dispersed sequentially in space. Reading requires a capability to encode, decode, sequence and synthesize phonemes and graphemes as well as to correctly translate each phoneme into the corresponding grapheme. The reading process entails unimodal and cross-modal integration, a complex intersensory associational process involving the integrity of both cerebral hemispheres. (Figure 7).

One of the major postulates for the basis of SLD is neural disorganization involving both cerebral hemispheres. The other theory assumes that the impairment lies in the central core of the brain, the area which transmits necessary information for the reading process to the higher cortical brain centers and associational areas.

As important as constitutional pre-determination are perinatal adverse events and illnesses during the period of rapid cerebral development. There is a high correlation between such events and SLD. Whether structural damage, maldevelopment or chemical imbalance is the basic factor for this neural disorganization remains

unresolved. The existence of more than one etiologic factor or the overlapping of factors is possible.

This etiologic diversity suggests that there may well be subtypes of SLD. Ingram's studies point to the likelihood that pure dyslexia is genetically determined while perinatal trauma impairs reading and mathematical skills. Mattis et al. contend that through a neuropsychological test battery, three syndromes can be identified. Our own clinical data support, that, with careful medical, psychometric, language and educational evaluation, SLD can be classified into clinical profiles.

Clinical diagnosis is not different from any problem-solving technique (Figure 8). The physician accumulates subjective (clinical history) and objective (physical examination and confirmatory laboratory tests and diagnostic tools) from which he assesses the problem and formulates a plan for therapeutic intervention.

The clinical diagnosis streams from an inductive construct of all salient, corroborative subjective and objective data. After obtaining a thorough clinical history the physician can usually arrive at a reasonable differential diagnosis, and frequently at the actual diagnosis. A differential diagnosis can be narrowed further with a careful patient examination. Diagnostic testing confirms the clinical impression.

The clinical history revolves around the presenting problem. The chief complaint serves as the point of reference around which clinical investigation proceeds. Often, the presenting problem in SLD is the child's failure to meet chronologic age-expected levels in learning and behavior. Usually, the problem remains unrecognized until school entry. It is not unusual, however, to elicit significant antecedent behavioral or developmental deviancy. Exploration of the family history and the child's past medical history helps in the diagnosis since genetic predetermination, adverse perinatal events and past illnesses are considered etiologic factors. Increasing evidence points to a significant correlation between SLD and delayed or deviant language development. Delayed or deviant language

development may well be the earliest clue to SLD. Hence, a thorough developmental history must be obtained. It is also interesting to note that since physicians are most likely to see children at a time when language skills are evolving, they can play a critical role in averting school failure by recommending early language evaluation when language skills are lagging.

It is well known that environment enriches language development and the learning process. Hence, a detailed psychosocial history is important in differentiating SLD from other learning problems such as primary emotional instability, cultural deprivation and behavioral problems, to mention a few. The cultural and educational backgrounds of the parents, their scholastic and behavioral expectations for their children, and their consistency in child management are important evaluative parameters.

When the SLD child is in school, an educational history must be obtained from the child, his parents and teachers. Often it is necessary to iron out inconsistent parent and teacher reporting. It is not unusual to find parents who are unaware of their children's actual grade level performance. Often physicians open communication between the parents and the school.

The general physical examination is usually unrevealing. A search for congenital anomalies may be useful for correlation studies. The neurologic examination may well be grossly normal. It is not unusual, however, to elicit soft neurologic signs. Peters has published data showing statistically significant correlation between soft neurologic signs and SLD. Thus, children presenting with learning problems should undergo special neurologic procedures (Table II) geared at eliciting soft neurologic signs. Table III shows some of those more commonly encountered.

In 1947, Bender advanced the concept that soft neurologic signs are indicative of brain dysfunction. However, many are normal findings in a young child. Hence, when interpreting their significance one must consider the child's chronologic and developmental ages. Some may also be a reflection of anxiety or a lack of attention.

When consistently present in a child who chronologically should not have them, soft neurologic signs become significant.

To establish the clinical diagnosis of SLD, the physician should screen academic and language skills. (Table IV)

Many SLD children are also hyperactive. Not all hyperactive children, however, are necessarily SLD. The hyperactive child has a learning problem because of his inability to attend; the SLD child has difficulty learning because of perceptual-integrative deficits. Hyperactivity can be intrinsic, a result of neural miswiring for lack of a better term, or extrinsic, when the hyperactivity is a response to external stress (Figure 9). Distinguishing one from the other is a difficult clinical task. Most intrinsically hyperactive children respond to medication. Elimination of the external stress, when possible, and environmental structuring are effective for extrinsic hyperactivity.

The diagnosis of SLD cannot be firm unless additional selective diagnostic tests are administered. The physician must have a familiarity with these tests, if he is to judge their relevance. The physician cannot achieve this clinical acumen unless he interacts with the educator and speech and language clinician.

An example of a clinical SLD profile may well be a non-reading 7 year 5 month old second grader whom the teacher describes as easily distractible, impulsive and whose attention span is short. He frequently disrupts the class and refuses to participate in academic work. He enjoys gym but often gets into fights. The parents cannot understand his poor school performance since they see him as a bright boy, if only he could be better motivated. His mother admits that he tends to be overactive and that there are times when his antics drive her "up the wall". The father does not regard his son's overactivity as unusual since he is "all boy". Disciplining the child is difficult according to his mother. The father, however, states that he can discipline the boy. He identifies with his son since he admits that he himself found schoolwork hard. Casually, the mother mentions that he rarely

pays attention to her, citing as an example how he brought back only the tablecloth when she asked him to go upstairs to get the tablecloth on top of the dresser, the sewing box from her bedroom and the scissors from the bathroom cabinet.

He was a full term baby, delivered rather precipitously. He achieved his motor developmental milestones well within the accepted ranges but language was delayed. The parents consulted their pediatrician who assured them that he would soon "grow out of it".

The boy is in a well structured phonics program at school.

The general physical examination was not remarkable. His neurologic examination confirmed his distractibility, impulsivity and short attention span. He showed synkinesia, difficulty with finger sequential tasks and occasional confusion following multiple, sequential commands.

The Wechsler Intelligence Scale for Children - Revised revealed a Verbal IQ = 99, a Performance IQ = 124, and a Full Scale IQ = 111.

Verbal Subtests		Performance Subtests	
I	6	PC	13
S	10	PA	15
A	5	BD	14
V	9	OA	15
C	12	C	6

The Full Scale score suggests an "average" functioning child intellectually. The 25-point discrepancy between the Verbal and Performance scores is highly suggestive of SLD. Intersubtest scatter analysis shows a disproportionately low Coding score among the Performance items, possibly indicative of difficulty with language symbol integration and recall.

An academic screen, using the Wide Range Achievement Test yielded grade equivalent scores of 1.5 in reading (word recognition), 1.4 in spelling and 2.7 in arithmetic.

On the Botel Reading Inventory a 30% accuracy score at a first grade level for silent reading comprehension and a 90% accuracy score at a third grade level for listening comprehension were obtained.

Results of the Boehm Test of Basic Concepts indicated problems in comprehension of abstract language and idioms, such as "equal, below, skip a". These results contrast vividly with a Peabody Picture Vocabulary Test IQ of 112 and a mental age of 8.0 However, the PPVT assesses more concrete nouns and action verbs, less demanding of high level auditory-verbal integration.

Foremost in the management of the SLD child is remedial and compensatory education. Physicians, especially pediatricians and neurologists, must keep abreast of available school programs in their communities. One must not divorce medical care from educational intervention. The SLD child often has other problems. School-parent-physician interaction is critical when the child in on medication. Physicians cannot monitor stimulant medication for the hyperactive SLD child without parental and teacher cooperation. Accurate reporting from teachers and parents can help concerned physicians control the indiscriminate use of stimulants. Parent education regarding the complexity of SLD and advice for home management is a medical responsibility. Effective management of SLD should be a coordinated effort among parents, school and physician.

We cannot escape from the fact that the complexity of SLD mandates a mutually respecting interprofessional team for diagnosis and successful intervention.

DIFFERENTIAL DIAGNOSTIC TESTING

SLD children frequently fall victim to slipshod diagnoses. They are described as exhibiting "visual-perceptual impairment" when, in reality, their perception is intact but their integrative or expressive abilities are handicapped. As a result children are too often given educational programs for the wrong disability. Careful interprofessional interpretation of test results can help avoid this.

The clinical tools listed on Table V have been found useful when interpreted both objectively and subjectively.

In using diagnostic tests to assess SLD, the following principles are important:

1. Learning theory and its application are important in choosing tests and interpreting them.
2. Diagnostic tests should not be relied upon to the exclusion of clinical intuition and common sense.
3. Diagnosis is a continuous process. Each day affords new opportunities to observe the child.
4. Do not "teach to a test", teach to a child who has been tested.
5. One test does not a diagnosis make!

Remediation and compensation work hand in hand to determine an appropriate treatment plan for the SLD child. Proper diagnosis should provide recommendations for effective treatment. Individualized curricula are important to insure progressive learning. Often, the most obvious educational conclusions escape realization. Individualization does not necessitate one-to-one education; small groups of children can work together if their needs and operational levels are relatively equal. Awareness of the child's chronologic, mental, developmental and social ages, together with an understanding of a child's modality strengths and weaknesses, can best help a teacher allow each child to accomplish these goals.

While a paper of this length does not permit an in-depth discussion of remedial strategies for SLD children, certain thought-provoking considerations include the following:

1. Teachers should feel comfortable in selecting from an array of educational materials. Merely insisting that teachers treat without adequate in-service instruction, however, is as irresponsible as insisting that children achieve without being taught.
2. Mass adoption of educational programs by school systems may result in gross neglect of a significant segment of the school population.

It has been learned that 25 states in the United States have adopted a standard basal text for reading. Seventy percent of children within these states are known to be reading below the national norm! Lack of flexibility in accommodating a child constitutes educational negligence.

3. Listening and looking are critical skills to be developed prior to the introduction of more sophisticated sound and letter activities. Not all readiness activities, however, are necessary. Many teachers persist in assuming that picture discrimination is prerequisite to letter discrimination. On the other hand, some children are very much in need of these kinds of preliminary alerting techniques. Such tools as Frostig sheets, which have recently undergone harsh criticism, can be useful assistants.
4. If a child is not ready to assimilate symbols but is desirous of associating oral with printed material, a Rebus-like program can serve a useful intermediary function in preparing a child for the more sophisticated later task of reading. Valuable time can be wasted waiting for a child to "get ready" while we could be training him in complimentary associative tasks.
5. Oral language remains the predecessor of good reading and writing skill. Elimination of basic verbal sharing sessions at home or at school can be costly. Writing these same oral experiences provides additional opportunities for good language modeling.
6. Writing styles should accommodate speed and execution. Given adequate instruction in both, if print is preferred to cursive, or vice versa, need age or grade requirements insist otherwise?

Factors that influence successful remediation are included on Table VI.

Past efforts at a multidisciplinary, interprofessional diagnostic-remedial program have been criticized as fragmenting the SLD child. Admittedly, this is a potential hazard. However, when meaningful dialogue exists among professionals, each of whom has relevant contributions, a common goal beneficial to the total SLD child can be achieved. This has been the Vermont experience.

CLINICAL MATRIX: SLD

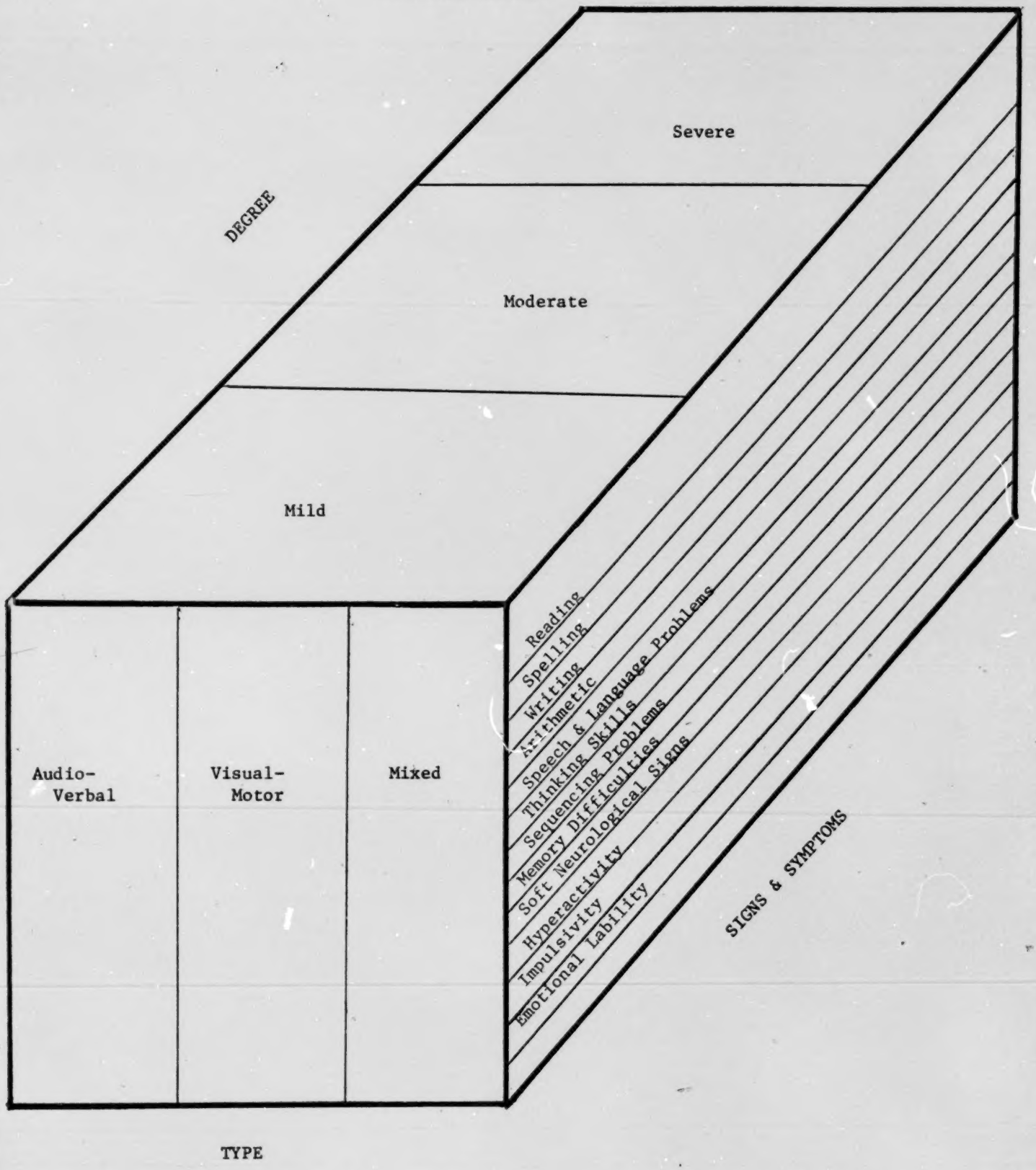


Figure 2

CHITTENDEN CENTRAL SCHOOL DISTRICT

Essex Junction, Vermont

PROBLEM ORIENTED SYSTEM FOR EDUCATIONAL SERVICES

P.O.S.E.

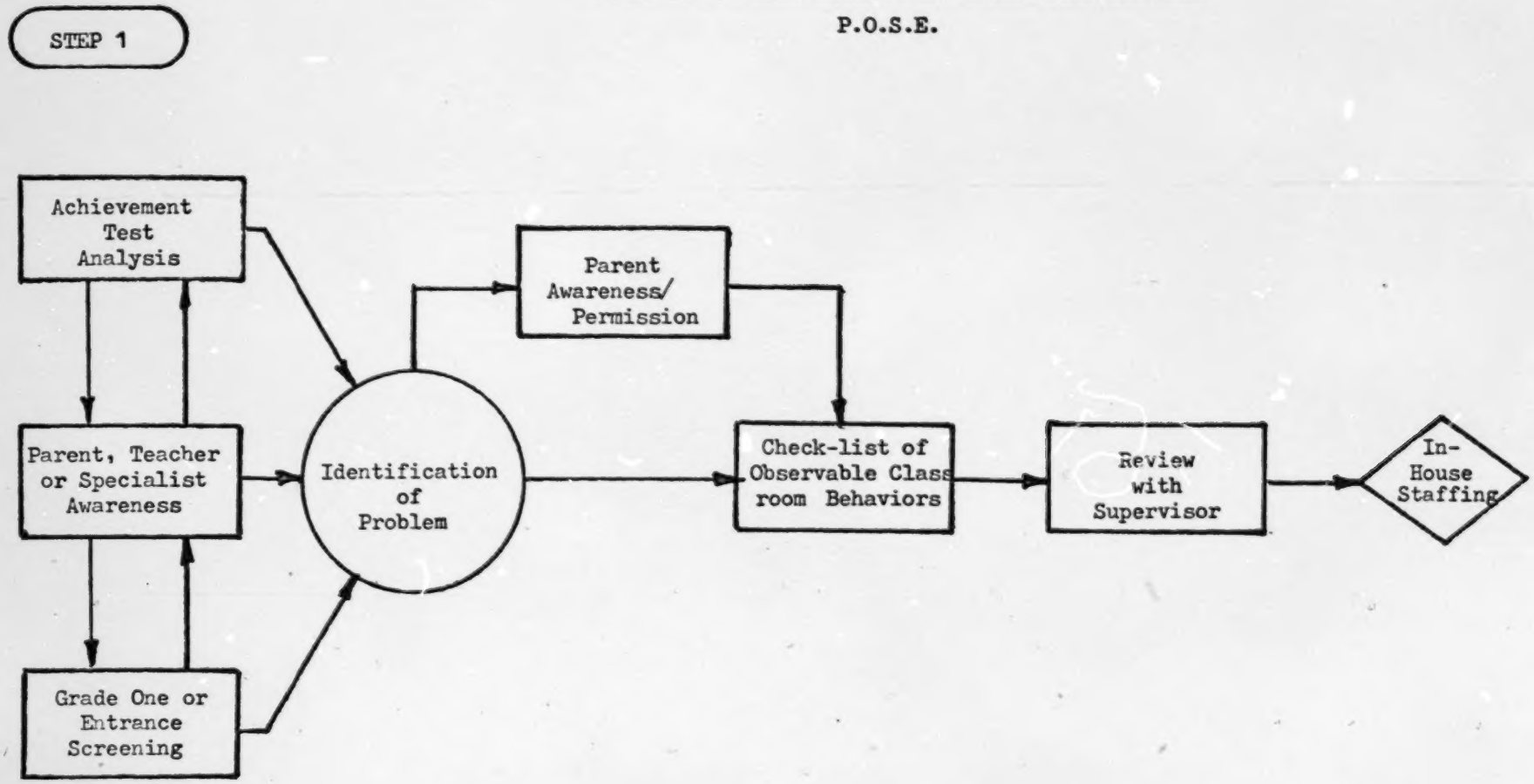


Figure 3

CHITTENDEN CENTRAL SCHOOL DISTRICT

Essex Junction, Vermont

PROBLEM ORIENTED SYSTEM FOR EDUCATIONAL SERVICES

P.O.S.E.

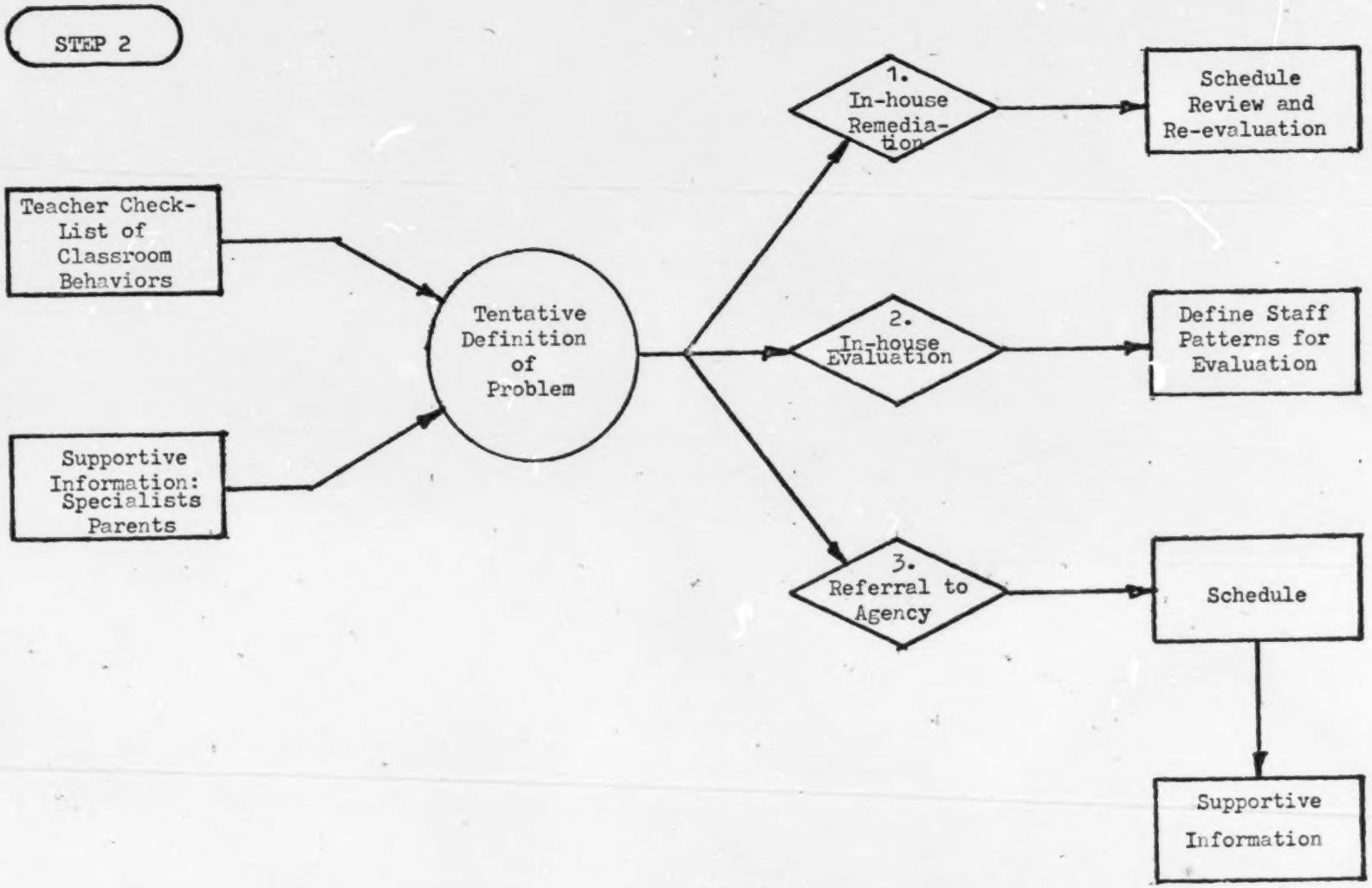


Figure 4

CHITTENDEN CENTRAL SCHOOL DISTRICT

Essex Junction, Vermont

PROBLEM ORIENTED SYSTEM FOR EDUCATIONAL SERVICES

P.O.S.E.

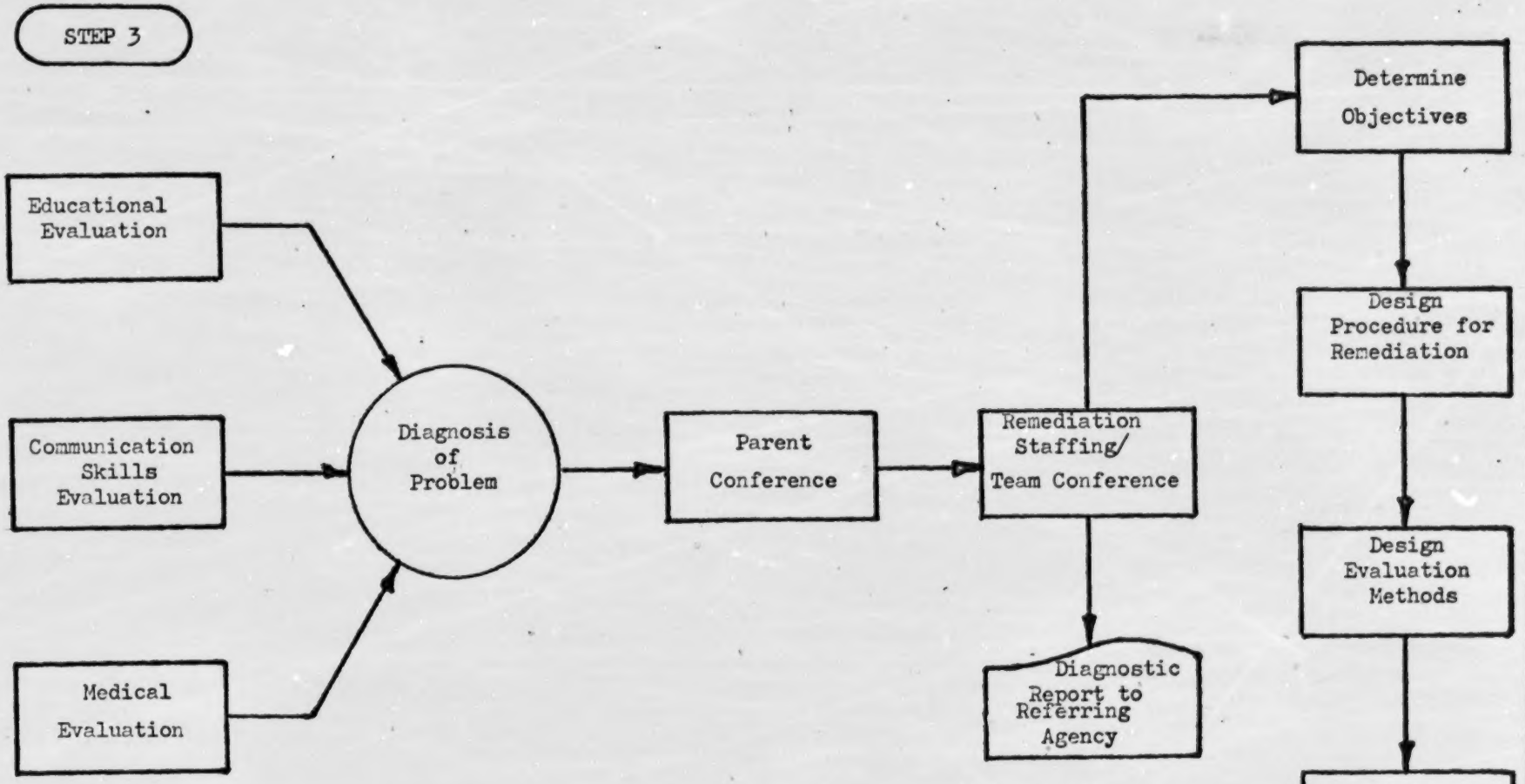


Figure 5

CHITTENDEN CENTRAL SCHOOL DISTRICT

Essex Junction, Vermont

PROBLEM ORIENTED SYSTEM FOR EDUCATIONAL SERVICES

P.O.S.E.

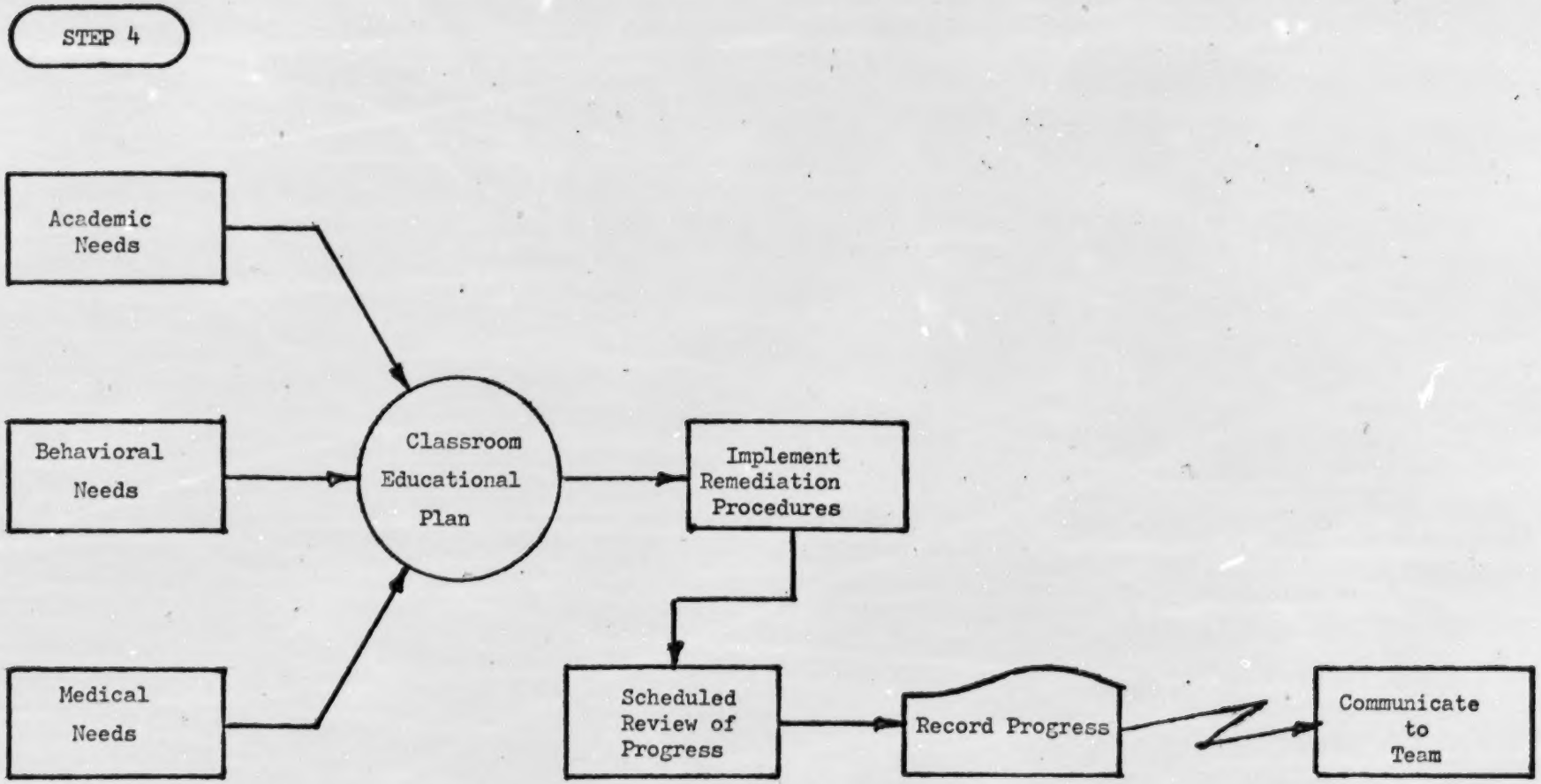


Figure 6

CHITTENDEN CENTRAL SCHOOL DISTRICT

Essex Junction, Vermont

PROBLEM ORIENTED SYSTEM FOR EDUCATIONAL SERVICES

P.O.S.E.

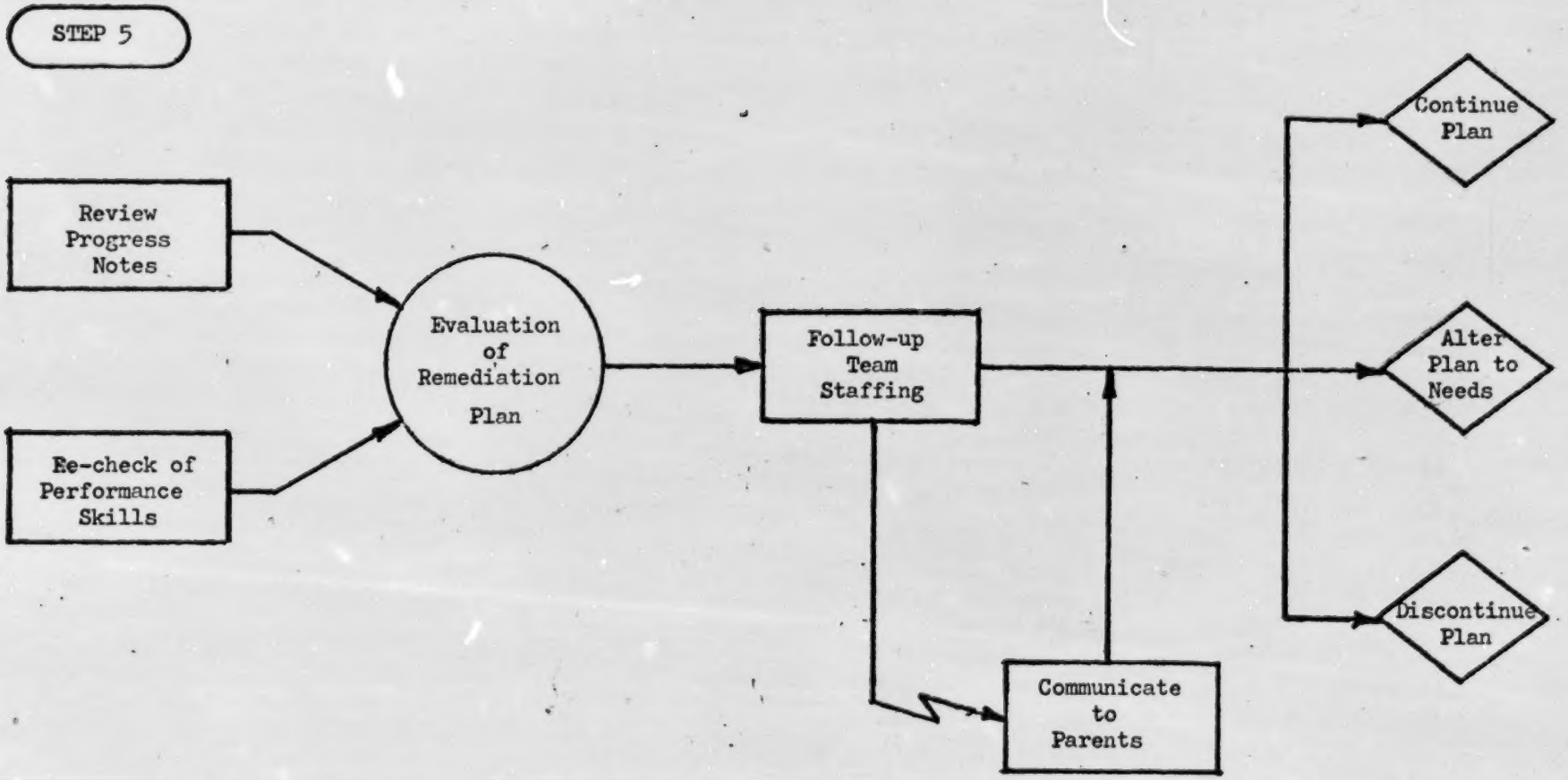
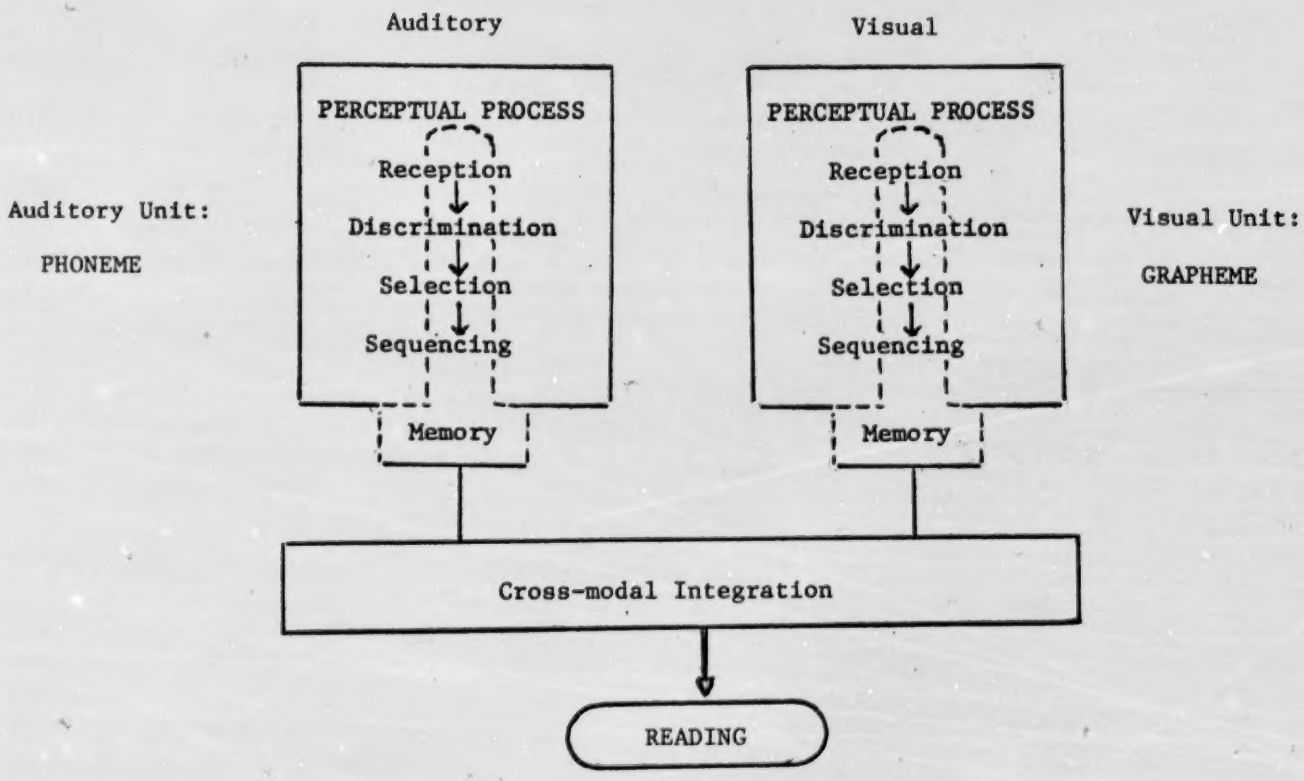


Figure 7

SCHEMATIC REPRESENTATION OF THE
BASIC INTEGRATIVE PROCESS FOR READING



In order to be able to read and write (spell) a child must be developmentally capable of symbol manipulation dependent upon intact intra- and intersensory integrative processing of auditory (phoneme) and visual (grapheme) sensory information.

Figure 8

DIAGRAMMATIC ILLUSTRATIONS OF STEPS TO
CLINICAL DIAGNOSIS AND MANAGEMENT

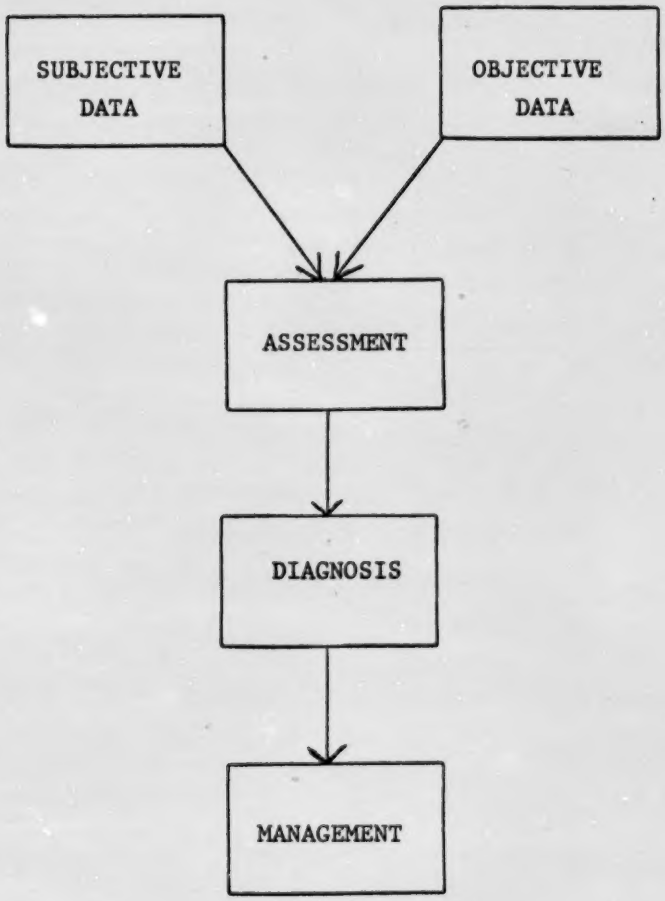
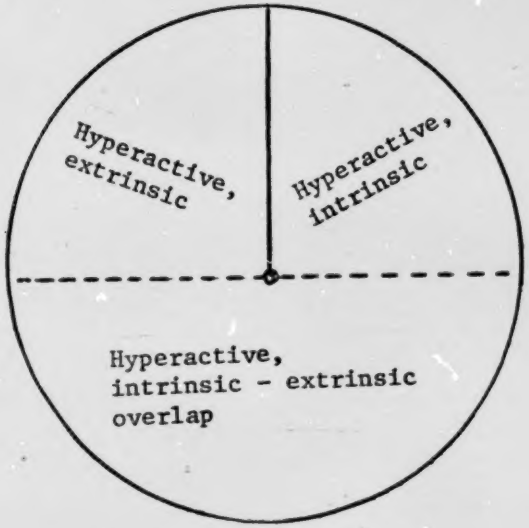
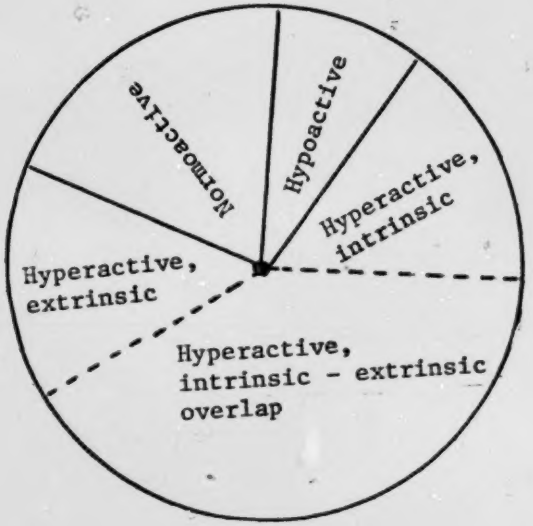


Figure 9

HYPERACTIVITY and SLD



Hyperactive Population



SLD Population

Hyperactivity does not necessarily imply the presence of SLD. Many SLD children, however, are hyperactive.

TABLE I

DIFFERENTIAL DIAGNOSIS OF LEARNING PROBLEMS

1. Health Problems
2. Motor Handicaps
3. Sensory Deprivation
4. Educational Deprivation
5. Socio-Cultural Deprivation
6. Mental Retardation
7. Emotional Disturbance
8. Behavior Disorders
9. Hyperkinetic Syndrome
10. Poor Motivation
11. Maturational Lag
12. Specific Learning Disability

TABLE II

SPECIAL PROCEDURES IN THE
NEUROLOGICAL EXAMINATION

General Observation

Posture

Gait

Gross Motor Skills

Fine Motor Skills

Performance of Repetitive Motions

Praxis

Spatial Orientation

Stereognosis

Graphesthesia

Double Simultaneous Stimulation

Mental Ability

Language Skills

Academic Skills

TABLE III

SOFT NEUROLOGIC SIGNS

Awkward Gait

Hand Posturing

Choreiform Movements

Clumsiness

-- Tasks Requiring Gross Motor Skills

-- Tasks Requiring Fine Motor Skills

Positional Tremor

Dysdiadochokinesis

Synkinesia

Poor Ocular Pursuit

Strabismus

Endpoint Nystagmus

Postural Reflexes: Whirling, Tonic Neck Responses

Mixed Laterality

Disturbance of Right - Left Discrimination

Table IV

LANGUAGE AND ACADEMIC SKILLS ASSESSMENT

A. Language Evaluation:
   1. Listening Skills
   2. Comprehension
   3. Expression
      a. Phonemic Skills
      b. Semantic Skills
      c. Syntactic Skills

B. Academic Evaluation
   1. Reading:
      a. Evaluate oral and silent reading skills.
         i. Word Recognition
         ii. Paragraph Reading
         iii. Comprehension

      b. Evaluate method used.
         i. Phonic
         ii. Sight
         iii. Both

   2. Writing:
      a. Production
         i. Pencil grasp
         ii. Movement of other body parts

      b. Product
         i. Spatial organization
         ii. Spelling
         iii. Reversals
         iv. Omissions
         v. Transpositions

   3. Arithmetic:
      a. Rote counting

      b. Number concepts

      c. Computation
         i. Oral } Number problems
         ii. Written } Word problems

      d. Reasoning

TABLE V

SELECTED ASSESSMENT MEASURES

PSYCHOMETRIC

Leiter International Performance Scale
Slosson Intelligence Scale (SIT) for Children and Adults
Stanford-Binet Intelligence Scale
Wechsler Intelligence Scale for Children-Revised (WISC-R)
Wechsler Pre-School and Primary Scale of Intelligence (WPPSI)

ACADEMIC

Botel Reading Inventory
Durrell Analysis of Reading Difficulty
Gray Oral Reading Test
Informal Reading Inventory
Morrison-McCall Spelling Test
Wide Range Achievement Test

LEARNING DISABILITY

Detroit Tests of Learning Aptitude
Illinois Test of Psycholinguistic Abilities
Meeting Street School Screening Test
Slingerland Test for Identifying Children with Specific Language Disability

SPEECH AND ORAL LANGUAGE

Boehm Test of Basic Concepts
Goldman-Fristoe Test of Articulation
Imitation of Sounds
Northwestern Syntax Screening Test
Peabody Picture Vocabulary Test
Templin-Darley Test of Articulation
Test for Auditory Comprehension of Language

AUDITORY

Goldman-Fristoe-Woodcock Test of Auditory Discrimination
Lindamood Auditory Conceptualization Test
Memory for Digits
Memory for Sentences
Wepman Auditory Discrimination Test

VISUAL-MOTOR

Beery-Buktenica Developmental Test of Visual Motor Integration
Bender-Gestalt Visual Motor Test
Frostig Development Test of Visual Perception
Goodenough Draw-a-Man Test

TABLE VI

FACTORS THAT INFLUENCE EFFECTIVE REMEDIATION

Child's innate intelligence

Child's personality

Attitude of people in immediate environment

- family
- teachers
- peers

Severity of disability

Availability of professional diagnostic skills

Facilities for programming